

Credible decarbonisation and transition for corporates in Asia

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Key highlights

- The United Nations (UN) Framework Convention on Climate Change [Paris Agreement](#), the science behind it, and the UN's [Sustainable Development Goals](#) are the guiding lights
- Climate mitigation and decarbonisation are mission critical and must be prioritised along with other related environmental and social objectives such as biodiversity and land use, and social rights as recognised under the Sustainable Development Goals (UN SDGs)
- Corporates play a significant role in reducing greenhouse gas (GHG) emissions globally and are strongly encouraged to follow an internationally accepted [carbon mitigation hierarchy](#)
- There are six key steps that corporates can take:

1.



Measure your carbon footprint, and understand the key risks and opportunities

2.



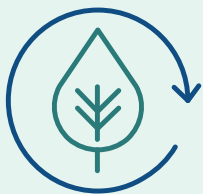
Set emission reduction targets according to the carbon mitigation hierarchy per these key steps, and align to science whenever possible. Consider the level of ambition e.g. mid-term at well-below 2°C, 1.5°C and a longer term net-zero target, with consistent interim milestones

3.



Reduce your absolute emissions footprint first within your operations, and within the company's supply chain

4.



Neutralise unavoidable residual emissions in the company's own supply chain by permanently removing carbon from the atmosphere or by using quality, permanent carbon removal credits

5.



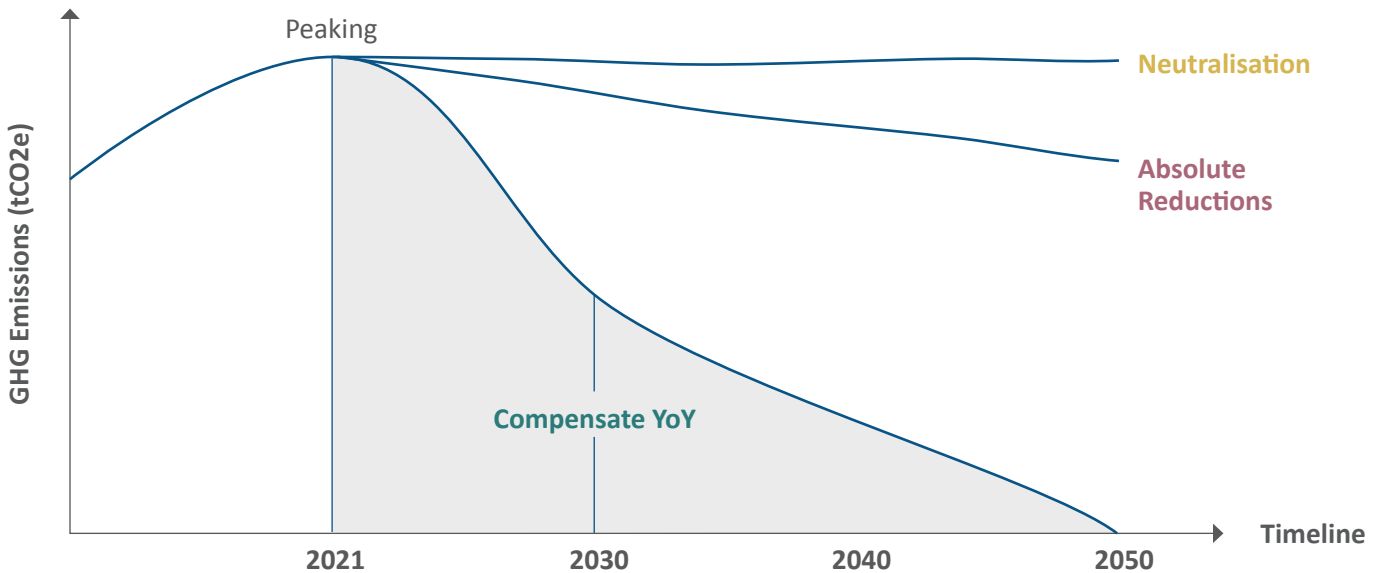
Compensate Year-on-Year (YoY) to prevent, reduce or eliminate GHG emissions inside the supply chain, and finance climate action through direct investments and quality carbon credits outside the supply chain

6.



Disclose the progress of your journey YoY for steps 1 to 5

- Companies to heed links to the existing reporting standards and their work-in-progress alignment
- Paris Agreement highlights the need for capital flows to meet climate goals, and financiers are starting to set their own goals and targets. Taxonomies are intended to guide this channeling and should be science-based, and developed in coherence with corporate disclosure standards and corporate climate mitigation action steps
- Corporates can leverage a range of instruments to finance their carbon reduction efforts as absolute reductions may require changes in capital and operational expenditure. Capital allocation by investors are shifting towards supporting thematic green and credible transitions and decarbonisation



Absolute reductions	Decarbonisation Capex intensive period →
Debt Financing options	1: Green bonds/loans 2: Sustainability bonds/loans 3: Transition bonds 4: Sustainability-Linked Bonds (SLBs) / loans
Equity Financing	Tap into increasing thematic and impact funds e.g. renewable energy fund or decarbonisation funds
Neutralise Carbon removals projects/credits	After all value chain reductions are prioritised, neutralise with investments in removal projects, credits or impact investments
Compensate	Year-on-year as best practice and last step, purchase carbon credits to mitigate ongoing emissions
Disclose	Disclose the target, progress and actions taken every year

- Exchanges play a critical role in facilitating capital flows to finance credible transition efforts by providing transparency, clear pricing signals and liquidity. Exchanges can also support and guide the market in capacity building and market instruments innovation

1. Introduction

The world economy is rapidly decarbonising - country by country, sector by sector, company by company. While the trajectory is clear, what does this mean in practice? This paper gives a practical overview and broad understanding of climate change mitigation pathways for corporates. It blends the science and practical know-how for management and senior practitioners within firms seeking a deeper understanding in decarbonisation efforts.

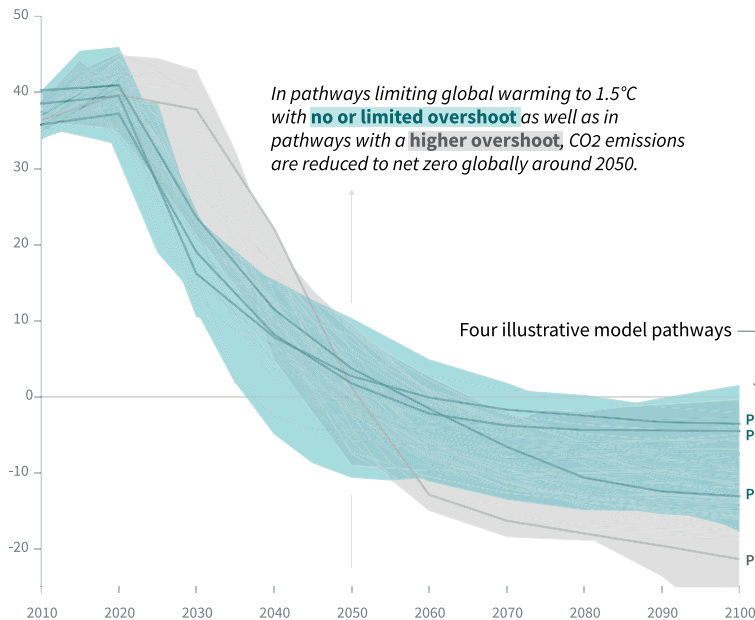
In 2018, the Intergovernmental Panel on Climate Change (IPCC) published a special report on “[Global Warming of 1.5°C](#)” (SR1.5), which underlines the critical importance of pursuing ambitious Paris Agreement pathways. The report reiterated the imperative need to cut carbon dioxide (CO₂) emissions by half above pre-industrial levels by 2030, and reach net-zero CO₂ emissions around 2050.

Net-zero CO₂ emissions are achieved when anthropogenic CO₂ emissions are balanced globally by anthropogenic CO₂ removals over a specified period.

The need for large-scale “carbon dioxide removal” (CDR) was outlined in the IPCC’s [Fifth Assessment Report](#) –the scientific basis for the Paris Agreement – and further in the SR1.5 report. SR1.5 states that “CDR would be used to compensate for residual emissions, and in most cases, achieve net negative emissions”. However, SR1.5 signals that negative emissions (removals) at large scale are unlikely to be achieved before 2040 and that near-term emissions reductions must be steep (roughly halving global emissions by 2030), suggesting an urgency for action for deep reductions in emissions including non- CO₂ emissions, particularly methane.

Global total netCO₂ emissions

Billion tonnes of CO₂/yr



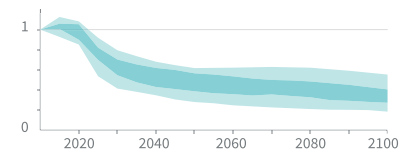
Timing of net zero CO₂
Line widths depict the 5-95th percentile and the 25-75th percentile of scenarios



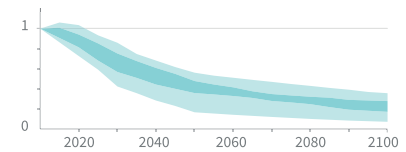
Non-CO₂ emissions relative to 2010

Emissions of non-CO₂ forcers are also reduced or limited in pathways limiting global warming to 1.5°C with **no or limited overshoot**, but they do not reach zero globally.

Methane emissions



Black carbon emissions



Nitrous oxide emissions

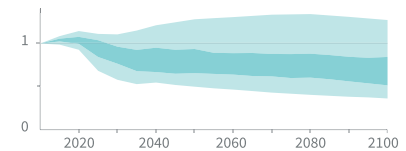


Figure 1

Source: IPCC Special Report on the impacts of global warming of 1.5°C

The world is **not on-track** to meet the agreed collective target of limiting warming to well-below 2°C. Under current policies, including the latest [Nationally Determined Contributions](#) (NDCs) – which are the voluntary blueprints by each Party to decarbonise under the Paris Agreement - the estimated warming will be in the range of 2.9-3.4°C by 2100 according to World Resource Institute (WRI).

1.1 How does Paris Agreement link to the Sustainable Development Goals?

The Sustainable Development Goals (SDG) are integral to the Paris Agreement.

First, SDG 13, Climate Action, urges countries and companies to take urgent action to combat climate change and its impacts. SDG 13 has five targets, which together seeks to systematically drive the world's actions in building climate resilience (Goal 13.1), climate risk mitigation (Goal 13.2), and adaptation (Goal 13.3).

The Paris Agreement Article 4.1 also highlights that achievement should be “on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty”.

Furthermore, the Paris Agreement outlines that “human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity” are equally important.

This acknowledges that other social factors such as food security, ending hunger and just transition of the workforce are fundamental priorities that contribute towards SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequalities).

The Paris Agreement also emphasises ecosystem protection including oceans and the protection of biodiversity, which contribute towards SDG 14 (Life Below Water) and SDG 15 (Life on Land).

The changes in climate already wrought as a result of anthropogenic warming mean we will now have a world of substantially increased volatility, from the physical impacts of climate change to destructive impacts of related biodiversity destruction such as pandemics, as the IPCC Health Committee has been warning for many years, to economic disruption as populations are forced to adapt and even move.

As well as physical resilience, there is an urgent need for increased social, economic and ecosystem resilience (“climate resilience”) in the face of this volatility, so that economies can better recover after what will become frequent shocks. The UN SDGs can be seen as indicators of such resilience, in essence proxies for climate resilience.

SUSTAINABLE DEVELOPMENT GOALS



Figure 2
Source: UN's [Sustainable Development Goals](#)

1.2 What are the proposed climate change mitigation outcomes in the Paris Agreement?

Absolute reduction of emissions is the primary outcome, according to the Paris Agreement. Article 4.1 highlights that net-zero will be achieved as a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases (GHGs) in the second half of this century.

However, recognising that the speed of absolute reductions may vary between developed and developing countries (Article 4.1 and IPCC report), Article 6 of the Paris Agreement enables “market mechanisms” (including carbon credits) to be used as a tool to support the ambitions of countries that wish to achieve their NDC objectives.

Countries that wish to take on greater climate ambition can acquire mitigation outcomes (including carbon credits) via international transfers of climate mitigation outcomes from another country. The obligations of countries to account for such transfer at the Paris Agreement level must avoid any accounting overlap with offsets used by corporates seeking to achieve their own net-zero ambitions (double claiming).

CDP recommends that there also be a link between the Paris Agreement and the actions and guidance given by central banks through the Network for Greening the Financial System.

1.3 What is a science-based decarbonisation pathway?

A science-based decarbonisation pathway means the targets adopted to reduce GHGs are in line with the level of decarbonisation required to keep global temperatures increase below 2°C or at 1.5°C, consistent with the IPCC analysis.

As corporates are not party to the Paris Agreement, they are not direct actors to balance global climate change mitigation under that framework. Nevertheless, as corporates are ultimately responsible for a significant share of global emissions they should support the goals of the Paris Agreement to reduce emissions to a state of net-zero emissions and beyond. At the most ambitious level, quantitative targets should be aligned with the IPCC 1.5°C ‘no’ and ‘low’ overshoot scenarios.



Among the many credible tools to assist corporates wishing to adopt science-based targets (SBT), one such guidance tool is developed by the [Science Based Targets Initiative](#) (SBTi), a partnership between [CDP](#), [United Nations Global Compact](#), [World Resources Institute](#) (WRI) and the [World Wildlife Fund](#) (WWF), in collaboration with the [We Mean Business Coalition](#).

SBTs according to SBTi span over 5-15 years into the future and clearly indicate how much and how quickly a company needs to reduce their emissions to be aligned with the Paris Goals. There are now more than 1,400 companies that have joined the SBTi out of which more than 700 already have approved SBTs in place. SBTi has also produced a SBT framework for financial institutions, which is relevant for readers in the financial ecosystem.

Recognising the importance of keeping global warming to 1.5°C, companies are now increasingly adopting longer term targets, such as net-zero climate targets. Over 500 companies have committed to reach net-zero emissions as part of the [Business Ambition for 1.5°C campaign](#), an urgent call-to-action for companies to set emissions reduction targets in line with a 1.5°C future and an official partner initiative of the [Race to Zero](#) by UNFCCC.




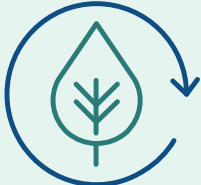
To ensure that companies’ net-zero targets translate into action that is consistent with achieving a net-zero world by no later than 2050, the SBTi launched a process to develop the first science-based standard for corporate net-zero targets which will result in detailed guidance to be launched around COP26 in November 2021. Apart from SBTi, corporates can also reference the [World Business Council for Sustainable Development](#) (WBCSD) to set and achieve ambitious science-based targets. As part of WBCSD’s Safe Operating Space (SOS) 1.5 project, WBCSD has created a [step-by-step roadmap](#) to help companies plan and execute their journeys to achieve net-zero emissions before 2050. Their framework guides corporates to accelerate their decarbonisation journey through six key steps and 16 actions.

What if my company is at the start of the decarbonisation journey?

We all have to start somewhere, and the most important is to make a start. Seek support from the most senior levels and the board, and even if the initial discovery phase may not lead to a science-based target setting in the first year, be aware of what a company in your sector can and should be doing. This should be raised at executive management committee levels and ideally discussed in the boardroom. Companies should also be aware through regular dialogue of sustainability-related developments pertinent to key external stakeholders such as shareholders, regulators, customers and civil society.

2. What are the key steps corporates should take to reduce GHG emissions?

We recommend six key steps for corporates:

<p>1.</p>  <p>Measure your carbon footprint, and understand the key risks and opportunities</p>	<p>2.</p>  <p>Set emission reduction targets according to the carbon mitigation hierarchy per these key steps, and align to science whenever possible. Consider the level of ambition e.g. mid-term at well-below 2°C, 1.5°C and a longer term net-zero target, with consistent interim milestones</p>	<p>3.</p>  <p>Reduce your absolute emissions footprint first within your operations, and within the company's supply chain</p>
<p>4.</p>  <p>Neutralise unavoidable residual emissions in the company's own supply chain by permanently removing carbon from the atmosphere or by using quality, permanent carbon removal credits</p>	<p>5.</p>  <p>Compensate Year-on-Year (YoY) to prevent, reduce or eliminate GHG emissions inside the supply chain, and finance climate action through direct investments and quality carbon credits outside the supply chain</p>	<p>6.</p>  <p>Disclose the progress of your journey YoY for steps 1 to 5</p>

1. Measure your carbon footprint

Having reliable carbon accounting is crucial. There are a variety of standards, methodologies, and protocols available for collecting and reporting GHG data, but the [Greenhouse Gas \(GHG\) Protocol](#) has been a key globally standardised framework and accounting standard to measure, report and manage GHG emissions from private and public sector operations, value chains and mitigation actions. GHG emissions are defined in three key types: Scope 1, Scope 2 and Scope 3.

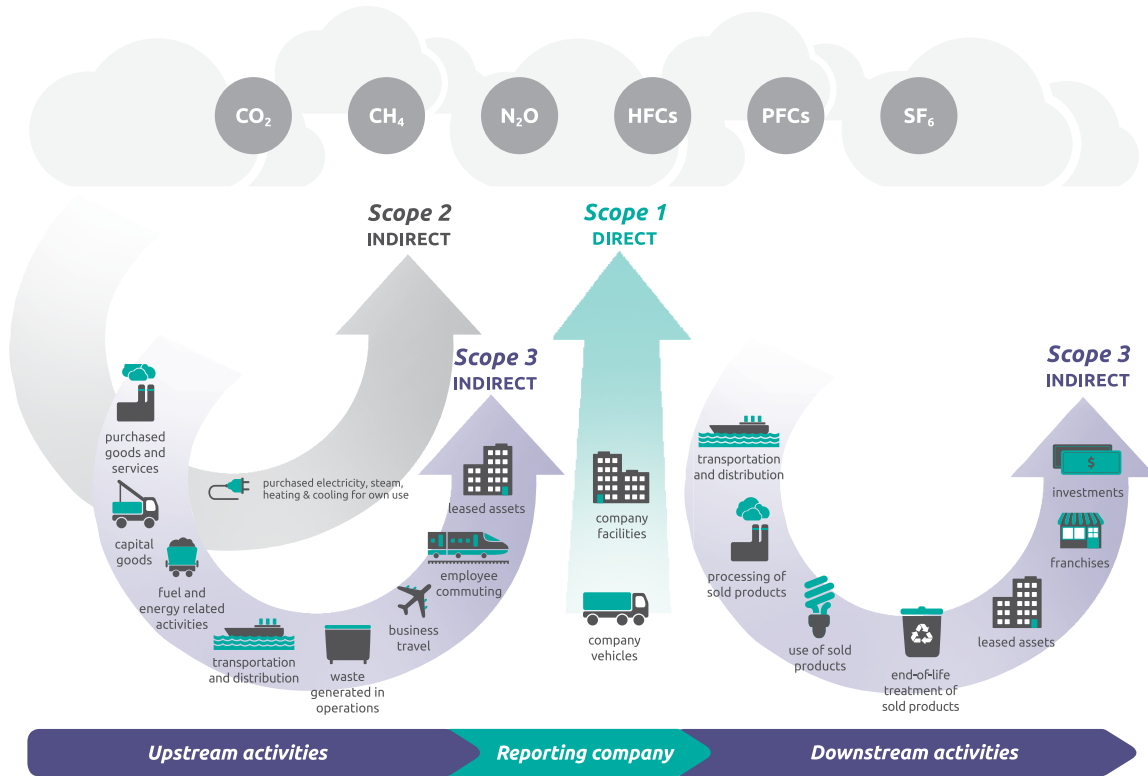


Figure 3
Source: WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard

Scope	Definition
Scope 1	Direct GHG emissions that occur from sources that are controlled or owned by an organisation (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles).
Scope 2	Indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling.
Scope 3	Includes all other indirect emissions that occur in a company’s value chain, e.g. purchased goods and services, business travel, employee commuting, use of sold products, leased assets. The Scope 3 emissions for one organisation are the Scope 1 and 2 emissions of another organisation, and often represent the majority of an organisation’s total GHG emissions. Product life cycle emissions are all the emissions associated with the production and use of a specific product, from cradle to grave, including emissions from raw materials, manufacture, transport, storage, sale, use and disposal.

Figure 4

A company should first measure their Scope 1 and 2 emissions and calculate the science-based targets, followed by measuring and calculating the Scope 3 targets. For Scope 3, define the scope of the relevant emissions, focusing on the material factors out of the 15 Scope 3 emission types. In addition, the best practice is to have the carbon footprint calculations verified by a third party.

Understand the key risks and opportunities

To understand the key financial risks and opportunities for corporates from climate change, a good starting point is the Taskforce for Climate Related Financial Disclosure ([TCFD framework](#)) established by the Financial Stability Board (FSB) in response to a call from G20. CDP's data indicates over 9,600 companies globally are reporting under TCFD as of 2020. For Asia Pacific, 3,000+ companies reported under TCFD in 2020.

The TCFD is a good framework to understand the big picture on climate-related risks and opportunities for the company. It asks pertinent questions for consideration around governance, strategy, risk management, metrics and targets (including quantitative carbon emissions reduction targets as one of the disclosure focus, which as best practice can be further linked to setting science-based decarbonisation targets).

These address the material information needed for financiers in turn to measure and respond to climate change risks. In the transition to a low-carbon economy and as climate-related disclosure regulations become increasingly common globally, new growth opportunities will arise across all sectors.

2. Set targets according to the carbon mitigation hierarchy

For setting your first climate targets, it is helpful to reference your peers as well as companies known to have best practices. Target setting should be guided both top-down and bottom-up:

1. **Top-down** by understanding the target reduction pathways required to reach well-below 2°C, 1.5°C and net-zero; and
2. **Bottom-up** by following the carbon mitigation hierarchy as roadmaps to what is achievable.

For the **top-down** approach, upon determining the target boundary, select the base year that will be the reference to set targets, and then the target year. SBTi's Absolute Emissions Contraction and Sectoral Decarbonisation Approach (SDA) provide perspectives on key pathways that can be taken in sectors such as power generation, cement and steel. The broad ambition criteria requirements are as follows:

Target Approach	Ambition Criteria
Absolute Contraction	At a minimum, Scope 1 and Scope 2 targets must be consistent with the level of decarbonisation required to keep global temperature increase to well-below 2°C compared to pre-industrial temperatures, though companies are encouraged to pursue greater efforts towards a 1.5°C trajectory.
Physical Intensity	The pathway must be representative of a company's activities and the timeframe ambition must be aligned with the minimum ambition threshold of the relevant SDA pathway or the minimum well-below 2°C ambition threshold of the absolute contraction approach.

Figure 5
Source: SBTi Criteria and Recommendations

¹CDP's questionnaire is fully aligned to the TCFD framework

Science-based net-zero targets go beyond the mid-term, 5-15 years science-based GHG reduction targets by taking a long-term view to ensure companies take responsibility for future emissions including future unabated residual emissions.

However, it is worth noting the definitions do not differ between 1.5°C and net-zero in IPCC’s SR1.5, as both SBTi and SR1.5 require pathways that lead to no new net anthropogenic emissions by 2050.

For **bottom-up** approaches, the carbon mitigation hierarchy dictates a hierarchy of actions that prioritises more direct actions such as emissions prevention and reduction. This ensures companies use all potential means to directly reduce their GHG emissions before seeking out indirect reductions via the retirement of carbon credits.

Let us take the car manufacturing industry as an example. In a bottom-up approach, a car manufacturer may consider the following actions:

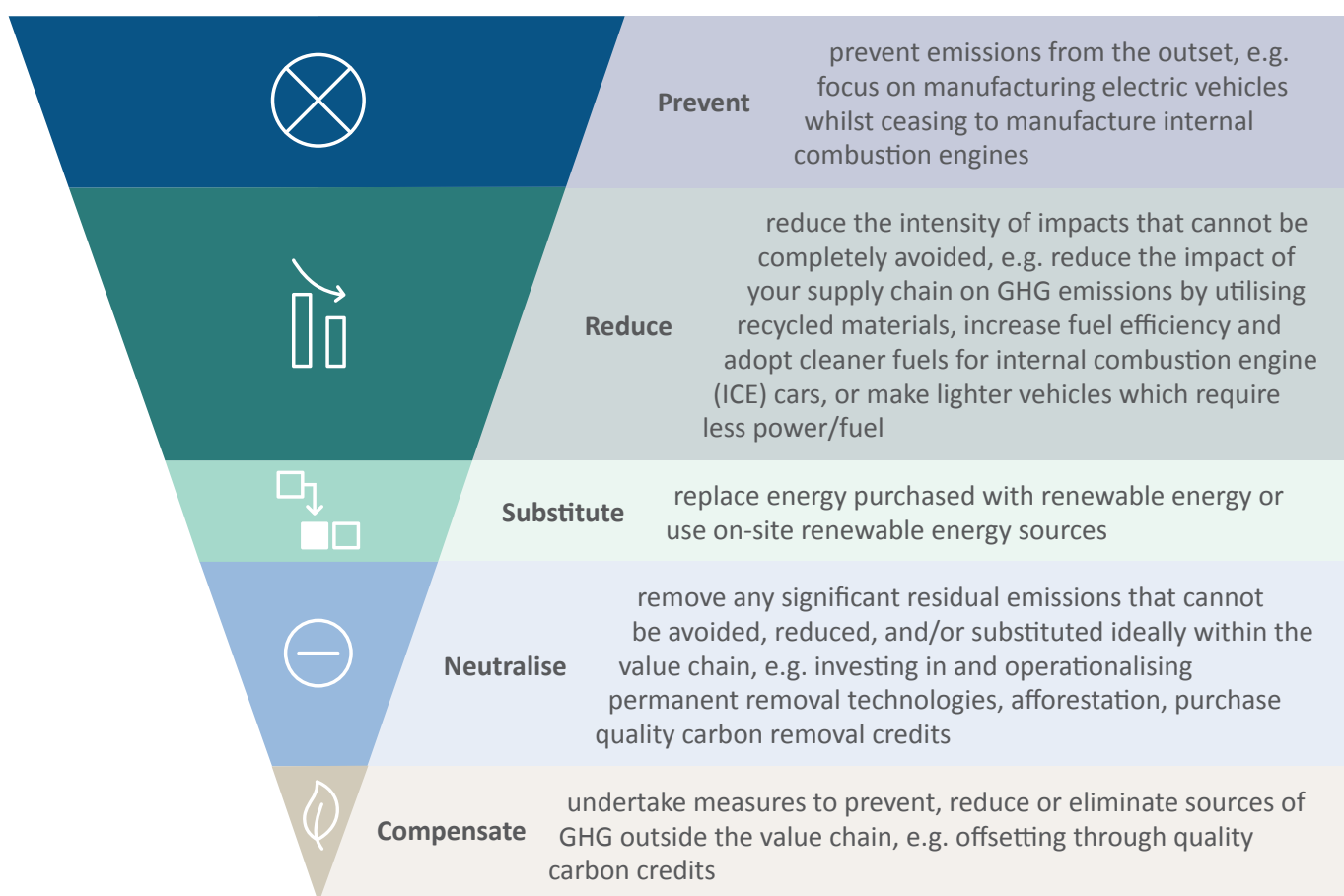


Figure 6
Source: Adapted from WWF’s Carbon Mitigation Hierarchy

It is worth noting that, according to SBTi, avoided emissions fall under a separate accounting system from corporate inventories and do not count toward science-based targets.

3. Reduce the absolute emissions footprint within the company operations and value chain

Having taken steps 1 and 2 above, the company must now work to reduce the emissions. The focus has to be on the most material emissions (i.e. largest amount), which differs by sector.

In order to develop the actual reduction strategy, one can also reference TCFD. Potential emission reduction opportunities should be identified scope by scope, item by item, before planning how the strategy could work within a set target timeframe.

The actual solutions differ per sector and scope, but broadly include energy efficiency measures including solutions to decarbonise cooling or heating systems, switching to renewable energy/low-carbon electricity generation and supply where feasible, and stakeholder engagement such as with suppliers and customers. It could also include charging internal carbon pricing which could be utilised to undertake further reduction measures or to purchase carbon credits.

Companies should frequently and critically review the available emission reduction pathways and solutions. As the renewable energy sector evolution demonstrates, technologies or solutions previously considered expensive or not at scale may become easier to adopt due to technological developments, falling costs, or new incentives.

4. Neutralising unabated emissions

Once absolute reductions within the company's own supply chain are maximised and planned over a given timeframe (e.g. 2030, 2040, 2050, 2060), companies should address their unabated residual emissions within their supply chain. Where appropriate, companies should "neutralise" their emissions to achieve their reduction target achievement. This means an equivalent amount of carbon emissions can be offset by direct investment within the company's own value chain (insetting) and by purchase and retirement of quality, robust and credible carbon removal credits that remove carbon from the atmosphere and store under as permanent measures as possible.

At the same time, it is also true that scaling up removals may take time and often is sector specific. According to the [Oxford Principles for Net Zero Aligned Carbon Offsetting](#), the pathway for carbon neutralisation should take into account available technologies, strategic goals in terms of equity and inclusivity, and funding availability.

There are broadly two types of carbon removals and a hybrid of the two with non-exhaustive examples:

1. **technological removals** such as geologic storage and direct air capture (DAC) with carbon capture storage (CCS) and long-term carbon capture utilisation storage (CCUS);
2. **biological** such as reforestation, afforestation, land restoration, soil carbon sequestration, improved land management and coastal carbon (e.g. mangroves); and
3. **hybrid of technological and biological**, such as carbon removal from bioenergy carbon capture and storage (BECCS).

Whilst type 2 is relatively more available today whether by direct investment into projects or by purchase of carbon credits that fund such projects with integrity, credibility and verifiable impact, it is also deemed that the rate of 'permanence' of carbon capture can be lower and requires ongoing monitoring and management.

Type 1 may provide more permanent solutions, but other environmental, social and cost factors such as competition in land usage for food should be closely monitored.

Companies should frequently and critically review the available emission reduction pathways and solutions. They should therefore explore their options in depth, in order to ensure they ultimately reduce the overall emissions when neutralising via removals and keep a close eye on market developments over time. Companies should further keep a clear tally of the proportion of its net-zero achievements and targets achieved by absolute reductions and those that will be achieved by neutralisation measures, to segregate the impacts according to the carbon mitigation hierarchy.

5. Concurrent compensation

Inevitably, as companies transition to a net-zero future aligned to the science-based targets, there will still remain unavoidable emissions. As such, companies are recommended to additionally mitigate carbon and GHG emissions while transitioning to net-zero as a best practice.

Whilst the SBTi states that the use of compensation cannot be counted as emissions reduction toward the achievement of companies' science-based targets, they encourage and recommend for companies to compensate for the remaining operational and supply chain emissions, as companies will continue to emit GHGs during their journey to net-zero.

Quality carbon credits (including credits to reduce, prevent or eliminate) should be integral to a holistic climate mitigation strategy to compensate for the emissions in addition to absolute reductions and removals in the operations and supply chain. This stance is aligned to the [Oxford Principles for Net Zero Aligned Carbon Offsetting](#) (the Oxford Principles) and [Taskforce for Scaling the Voluntary Carbon Markets](#) (TSVCM).

The Paris Agreement Article 5.1 also highlights the importance of action to “conserve and enhance, as appropriate, sinks and reservoirs of GHG”. The majority of the carbon credits available today focus on reduction and avoided emissions including prevention of deforestation according to the Oxford Principles. Such carbon credits must also be verified and of quality.

What makes a quality carbon credit?

A quality carbon credit is one where there is a genuine, verifiable net reduction or removal of at least one tonne of CO₂ equivalent. It also needs to be permanent, only used once to make a carbon reduction claim, and would not have existed if not for the carbon credit project. The project must also not be associated with significant social or environmental harms and ideally contribute to the other objectives such as social impact and biodiversity.

The TSVCM estimates that the demand for carbon credits could increase by more than equal to 15 times by 2030 and up to 100 times by 2050 – resulting in the market for carbon credits being worth more than US\$50 billion in 2030.

It is therefore imperative that buyers ensure they are buying quality carbon credits for real impact of their purchases on absolute emissions. Furthermore, with the advent of COP26 and key focus on Article 6 of the Paris Agreement on market mechanisms including the usage of mitigation outcomes (including carbon credits) as well as rapidly evolving views on the role of neutralisation and compensation in net-zero journey, all actors must closely observe and be involved in the development.

6. Disclose the progress of your journey YoY for steps 1 to 5.

In undertaking all the steps in 1 to 5 above, it is important for corporates to provide clear disclosure and reporting on their actions, strategy and targets. Climate-related disclosures are the primary focus today with both the [Better Alignment Project](#) and the [IFRS Foundation's Sustainability Standards Board](#) using climate-related disclosures based on the TCFD's recommendation as the anchor for converging global sustainability reporting standards.

It would also be prudent to continuously be in discourse with companies in your sector or peer group, to benchmark and to help drive systemic change. Ultimately, stakeholders such as investors, NGOs and civil society need to understand the credibility of companies' holistic sustainability and transition plans. Hence, clear articulation of short and long-term decarbonisation plans with progress updates would help seek common ground with stakeholders.

3. Financing your decarbonisation journey

The Paris Agreement Article 2.1c stipulates the importance of making finance flows consistent with a pathway towards low GHG emissions and climate-resilient development. In line with this, numerous financing initiatives have emerged to enable financial institutions to align their portfolios with the Paris Agreement whilst ensuring a smooth and inclusive transition. Examples include the [UN Net-Zero Asset Owner Alliance](#), Institutional Investors Group on Climate Change (IIGCC)'s '[Net Zero Investment Framework](#)', and [Net-Zero Banking Alliance](#) respectively. These highlight that the finance industry is starting to make high-level, ambitious commitments and will start to set their own targets.

3.1 Link to taxonomies

In the past few years there has been a significant proliferation of “taxonomies”, such as the [EU Taxonomy for Sustainable Activities](#), China's [Green Bond Endorsed Projects Catalogue](#), Malaysia's [Climate Change and Principle-based Taxonomy](#), Singapore's [Green Finance Industry Taskforce taxonomy consultation](#) and now the [ASEAN Taxonomy of Sustainable Finance](#) is in the works.

The EU taxonomy particularly outlines the definition and/or thresholds for greenness at the project level and typically includes life cycle analysis. This will first and foremost be utilised by investors to achieve the Paris Agreement and be incorporated into the EU disclosure standards which will also have an impact on Asia, as the application of the EU Taxonomy by the European headquartered investors and companies may be global in nature.



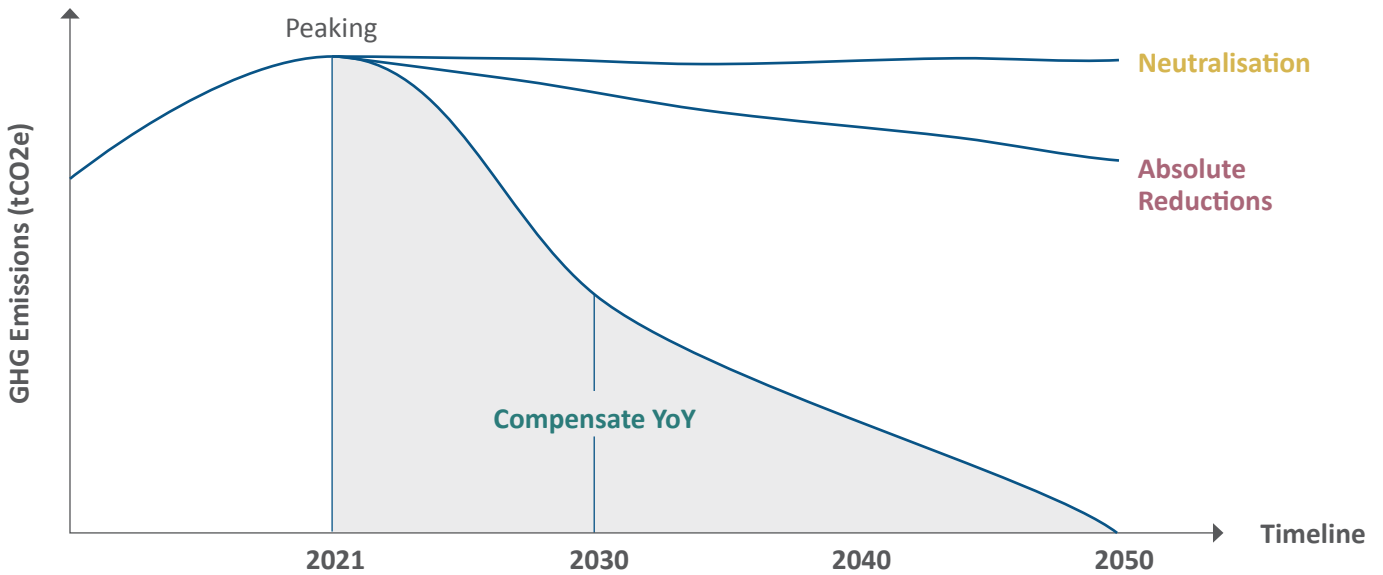
Taxonomies will have to be coherent with the journey that corporates must go on, whether that be in carbon management, science-based targets or disclosure standards. While it is important to have a common language to facilitate cross-border activities, these taxonomies may still need to take into context the differing regional and local material requirements, for example respect to activities, sectors and levels of granularity. In the meantime, whilst the taxonomies landscape rapidly evolves, it would be prudent for companies and financiers to heed the relevant taxonomies in their jurisdictions to finance the reduction of emissions.

3.2 What does this mean for companies?

As companies transition, capital flows need to be directed towards credible efforts that drive the transition. Such projects tend to be capital intensive and require significant funding that can be obtained through listed bond or equity issuances.

In May 2021, the International Energy Agency (IEA) produced a [seminal report for the energy sector](#) highlighting the need for seismic changes to the global energy system in order to meet the goal of net-zero emissions by 2050. Crucially, the report states that 630 gigawatts (GW) of solar PV power and 390 GW of wind power need to be added to the global energy system by 2030, while unabated coal and oil power plants must be phased out by 2040. Whilst the report acknowledges that emerging markets and developed markets may move at a different pace towards net-zero, the overall trajectory set-out is a strong signal, given IEA's reports are used by [World Economic Outlook](#) (WEO), to policy makers and for scenario planning by financiers and corporates among others.

Below is a depiction of the overall typical journey, and where various financing instruments may come in.



Absolute reductions	Decarbonisation Capex intensive period →
Debt Financing options	1: Green bonds/loans 2: Sustainability bonds/loans 3: Transition bonds 4: Sustainability-Linked Bonds (SLBs) / loans
Equity Financing	Tap into increasing thematic and impact funds e.g. renewable energy fund or decarbonisation funds
Neutralise Carbon removals projects/credits	After all value chain reductions are prioritised, neutralise with investments in removal projects, credits or impact investments
Compensate	Year-on-year as best practice and last step, purchase carbon credits to mitigate ongoing emissions
Disclose	Disclose the target, progress and actions taken every year

It is of paramount importance that transition-related financing instruments such as transition bonds, sustainability-linked bonds and loans align to the materiality of the company and sector, and take into consideration whether the company or issuer at the corporate level has credible sustainability strategy and targets.

It is highly recommended that companies or issuers of these instruments follow closely the recommendations in the [Sustainability-Linked Bond Principles](#), the [Climate Transition Finance Handbook](#), and the [Sustainability Linked Loan Principles](#) for these instruments. Climate Bonds Initiative’s paper jointly produced with Credit Suisse on [Financing Credible Transitions](#) is also a useful reference point. Ideally such instruments should be directly in support of the overall decarbonisation and transition pathways that companies follow, as outlined throughout this document. Issuers looking to raise sustainable funding through green, social, sustainability or sustainability-linked bonds may also tap on bond incentivisation programmes such as the [Monetary Authority of Singapore \(MAS\) Sustainable Bond Grant](#) and [Global-Asia Bond Grant](#) schemes that align with international principles. For green and sustainability-linked loans, a similar loan grant scheme exists – the [Green and Sustainability-Linked Loan Grant Scheme](#).

Sustainable investing already encompasses well-established strategies. Thematic investing strategy is growing to support and fund decarbonisation technologies and companies, including renewable energy funds and decarbonisation funds such as the recent launches of [Decarbonization Investment Partnership](#) by [Temasek](#) and [Blackrock](#), a [Japanese Government fund to help decarbonisation in 26 ASEAN cities](#) and [Maritime and Port Authority of Singapore’s decarbonisation fund](#) for a maritime decarbonisation centre launched with industry partners. In addition, depending on the country and sector, there are grant schemes available to support decarbonisation efforts.

Over time, capital will reallocate as investors fully integrate ESG (environment, social, governance) into their investment decisions, and seek out the best-in-class green and sustainable companies and technologies. According to the [MSCI 2021 Global Institutional Investor Survey](#), 57% of investors in Asia Pacific will have “completely” or “to a large extent” integrated ESG issues into their investment processes by end-2021. PwC projects 63% growth in assets held in European ESG mutual funds by 2025 (EUR1.7 trillion in 2019 to EUR5.4 trillion in 2025).

Climate alignment and resilience are key factors in investors’ decisions, so companies must prepare themselves for this tectonic shift already in motion. Already the negative exclusionary screening strategy of many investors and banks include thermal coal and the risk of stranded assets for high emission sectors and assets will increase over time unless action is taken at company and asset levels. The practical guidance in this paper will help that preparation.

4. How can exchanges support corporates’ decarbonisation journey

Exchanges exist to facilitate the flow of capital and trading, enabling liquidity, transparency and price discovery. They can also support and guide the market by providing standardised sustainability products and contracts, innovating on new products for the market, lead in capacity building and provide market integrity support via regulations.

Exchanges further play a critical role in ensuring that reliable data is available to investors to make informed decisions. For example, exchanges can highlight uniformly the bonds issued for sustainable or transition projects that follow internationally accepted green, social, sustainability bond standards or taxonomies. Disclosure regulations for equities play a similar role in providing investors with material ESG and climate-related data for investment decisions.



As companies increasingly perform better in embedding sustainability and taking climate action, they will be included in ESG and climate impact indices. Such thematic indices are utilised for exchange-listed products such as exchange traded funds (ETFs) for capital allocation by investors.

Looking beyond capital raising, relevant corporates will need to hedge commodity flows to manage their risks. Exchanges can fill this gap by developing innovative commodity contracts to support market needs. These contracts may range from greener versions of the relatively traditional commodity contracts such as contracts for high-grade iron ore or lower sulphur fuels, to sustainable fuels and offset commodity transport, to cutting edge contracts such as weather, catastrophe or carbon derivatives.

As companies embark on their decarbonisation journeys, there will be a growing market for carbon credits to offset any hard-to-abate emissions. Exchanges can support the growth of these markets by providing a trusted platform for the trading of quality carbon credits.

5. Conclusion

Sustainability is a journey, not a destination. This document is intended as a guide to help companies' overall decarbonisation and transition journeys. Companies should build credible strategies, execution plans and actions to future proof revenue, market share and capital raising, whilst capturing opportunities that come with a generational and seismic shift towards a low-carbon and sustainable economy.

About Singapore Exchange



Singapore Exchange is Asia's leading and trusted securities and derivatives market infrastructure, operating equity, fixed income, currency and commodity markets to the highest regulatory standards. It also operates a multi-asset sustainability platform, SGX FIRST or Future in Reshaping Sustainability Together (sgx.com/first).

SGX is committed to facilitating economic growth in a sustainable manner leveraging its roles as a key player in the ecosystem, a business, regulator and listed company. With climate action as a key priority, SGX aims to be a leading sustainable and transition financing and trading hub, offering trusted, quality, end-to-end products and solutions.

SGX leads as the preferred listing venue for ESG bonds in Asia Pacific, where more than half of these listings are on SGX with issuers spanning diverse ESG themes across the Asian geographies. As a key commodity market player committed to climate action, SGX works closely with the various commodity industries to offer ESG-related commodity derivatives. SGX's suite of ESG indices serves as an investable basis from which financial institutions can track and monitor a portfolio of ESG filtered SGX-listed equities in a transparent manner. SGX recently announced the intention to launch Climate Impact X, a carbon exchange and marketplace with partners DBS Bank, Standard Chartered and Temasek.

About Climate Bonds Initiative



Climate Bonds Initiative is an international investor-focused not-for-profit organisation working to mobilise global capital for climate action.

The Climate Bonds Initiative works to:

- Bring together investors concerned about the forward risk of climate impacts
- Help build for those investors a universe of investible opportunities that also address climate change
- Collaborate with governments and regulators on how to ensure sustainable returns that both mitigate the risk of financial instability and ensure institutional investors will be able to meet their assets and liability matching requirements

That means green finance market research, development and promotion; advisory work for governments and regulators; development of green taxonomies; and administering an international Standard & Certification Scheme for best practice in green bond issuance.

Climate Bonds latest project is to develop frameworks to grow a transition bond market that supports decarbonisation of high-carbon industry sectors.

For more information see: <http://www.climatebonds.net>

About CDP



CDP is a global non-profit that runs the world's environmental disclosure system for companies, cities, states and regions. Founded in 2000 and working with over 590 investors with \$110 trillion in assets, CDP pioneered using capital markets and corporate procurement to motivate companies to disclose their environmental impacts, and to reduce greenhouse gas emissions, safeguard water resources and protect forests. Over 10,000 organisations around the world disclosed data through CDP in 2020, including more than 9,600 companies worth over 50% of global market capitalisation, and over 940 cities, states and regions, representing a combined population of over 2.6 billion.

Fully TCFD aligned, CDP holds the largest environmental database in the world, and CDP scores are widely used to drive investment and procurement decisions towards a zero-carbon, sustainable and resilient economy. CDP is a founding member of the Science Based Targets initiative, We Mean Business Coalition, The Investor Agenda and the Net Zero Asset Managers initiative.

About HFW



HFW is a global law firm with over 600 lawyers working across 17 offices in Africa, the Middle East, Asia, Australia, America and Europe. In Asia, we have offices in Singapore, Hong Kong and Shanghai. We continue to extend our geographical footprint through associations with local law firms in key strategic jurisdictions, including in Riyadh and Kuwait City and also a Formal Law Alliance (FLA) in Singapore with Asia Legal LLC. We seek to use our legal and sector expertise, networks and corporate responsibility initiatives to enable sustainable practices across all of our operations and the industries that we service, and to drive meaningful and lasting change.

In addition to our climate change expertise, where we advise clients on climate finance issues and environmental products markets, we are also at the forefront of the renewable energy market. Our lawyers advise companies and financiers on all aspects of the project life cycle and across the renewable energy spectrum, including onshore and offshore wind, solar, hydro, energy-from-waste, marine bio-processing, biomass and biofuels.

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